

What is claimed is:

Sub 05 1. A system for dermatological examination of the skin tissue of a patient comprising:

5 means for maintaining an area of the skin tissue under stress by application of force at the edges of said area; and

an imaging head coupled to said means for imaging said stressed skin to provide therewith an integrated assembly.

10 2. The system according to Claim 1 wherein said maintaining means further comprises:

a platen which is positionable with respect to said patient, said platen having an orifice, and said imaging head being coupled to said platen and positioned for imaging through said orifice; and

15 first means for moving said platen from an up position in which said platen is spaced from said patient to a down position onto the surface of said skin tissue of the patient, whereby in said down position the force of said platen provides said stressed skin tissue within said orifice.

20 3. The system according to Claim 2 wherein said maintaining means further comprises:

second means coupled to said platen for moving said platen with respect to said patient and temporarily fixing the position of said platen so that said skin tissue to be imaged is located within said orifice when said first means moves said platen to said down position.

25 4. The system according to Claim 3 wherein said second means further comprises:
a table having a surface supporting said patient and two opposing sides spaced apart from each other on opposite sides of said patient;

two first rails, each of said first rails being parallel to each other and located upon a different one of said opposing sides;

two second rails orthogonal to said first rails which are parallel to each other and movable together along said first rails;

5 a carriage supporting said platen which is movable along said second rails;
means for locking said second rails at a position with respect to said first rails;
and

means for locking said carriage at a position with respect to said second rails.

10 5. The system according to Claim 4 wherein said first means comprises a plurality of rods coupling said platen to said carriage for positioning said platen in one of said up and down positions.

15 6. The system according to Claim 2 wherein said maintaining means further comprises:
means coupled to said imaging head and said platen for translating said imaging head with respect to said orifice of said platen.

20 7. The system according to Claim 6 wherein said platen further comprises a recording media, and said translating mean further comprises a translation stage and a marker coupled to said translation stage which is positioned over said media to record the motion of said translating stage as it moves said imaging head over said stressed tissue within said orifice.

25 8. The system according to Claim 2 wherein said orifice has a plate positioned therein.

9. The system according to Claim 1 said maintaining means further comprises:
a brace supporting said imaging head which comprises an opening in said brace
through which said imaging head images said skin tissue, and means for restraining said brace
to the body part of the patient having said skin tissue to force said brace against said skin
tissue and provide within said opening of said brace said stressed skin tissue.

10. The system according to Claim 9 wherein said brace further comprises an upper
lamination coupled to said imaging head, and a lower lamination coupled to said restraining
means, said lower lamination having said opening and slots for receiving said upper lamination
in which said upper lamination is movable within said slots over said lower lamination and
temporarily fixable within respect to said lower lamination, said upper lamination having an
aperture substantially smaller than said opening of said lower lamination through which said
imaging head images said stressed skin tissue within said opening of said lower lamination.

11. The system according to Claim 10 wherein said lower lamination comprises a
surface which approximates the surface of the skin tissue, and said upper lamination comprises
a rigid member parallel with said lower lamination.

12. The system according to Claim 10 wherein said aperture has a transparent plate
positioned therein.

13. The system according to Claim 1 wherein said maintaining means further
comprises:
an attachment having an inner member and a flexible outer member extending
radially from said inner member; and
means for creating a vacuum between said attachment and the surface of said
skin tissue, to force said skin tissue against said inner member and provide adjacent to said

inner member said stressed tissue, in which said imaging head images said stressed skin tissue through said inner member.

14. The system according to Claim 13 wherein said outer member has a semi-rigid ring along its outer periphery, and an annular protruding section which defines inner and outer cavities when said attachment is adjacent to said skin tissue.

15. The system according to Claim 14 wherein said vacuum suctioning means further comprises means for selectively creating suction in said inner and outer cavities when said attachment is adjacent to said skin tissue to pull said skin tissue into said cavities, thereby applying stress to the skin tissue adjacent to said inner member.

16. The system according to Claim 13 wherein said first member is a circular window having an optical index approximately matching said skin tissue.

17. The system according to Claim 13 wherein said second member is a deformable diaphragm which is less compliant than said skin tissue.

18. The system according to Claim 13 wherein said vacuum suctioning means further comprises means for suctioning air or a liquid, applied to the surface of said skin tissue, between said attachment and said skin tissue.

19. The system according to Claim 1 wherein said imaging head is a confocal imaging head having confocal imaging optics for providing images of sections of said stressed skin tissue.

20. An apparatus for stabilizing the skin tissue of a patient to an imaging head comprising:

a platen having an orifice;

first means for moving said platen from an up position in which said platen is spaced from said patient to a down position onto the surface of said skin tissue of the patient; and

second means for moving said platen over the patient and temporarily fixing the position of the platen with respect to said patient wherein the skin tissue to be imaged by said imaging head is stabilized within said orifice when said platen is in a down position.

21. The system according to Claim 20 wherein said second means further comprises:

a table having a surface supporting said patient and two opposing sides spaced apart from each other on opposite sides of said patient;

two first rails, each of said first rails being parallel to each other and located upon a different one of said opposing sides;

two second rails orthogonal to said first rails which are parallel to each other and movable together along said first rails;

a carriage supporting said platen which is movable along said second rails;

means for locking said second rails at a position with respect to said first rails;

and

means for locking said carriage at a position with respect to said second rails.

22. The system according to Claim 21 wherein said first means comprises a plurality of rods coupling said platen to said carriage for positioning said platen in one of said up and down positions.

23. The system according to Claim 20 wherein said maintaining means further comprises:

a means coupled to said imaging head and said platen, for translating said imaging head with respect to said orifice of said platen.

5 24. An apparatus for stabilizing the skin tissue of a patient to an imaging head comprising:

10 a structure providing a brace and having straps which attaches said brace structure to the surface of the skin tissue, a lower lamination comprising a surface which approximates the surface of the skin tissue, and an upper lamination over said lower lamination having a surface with an opening defining a viewing window; and

15 said lower lamination further comprising slots in which said upper lamination is received, and an opening through which said skin tissue to be imaged by said imaging head is located, wherein said upper lamination is slidable over said surface of said lower lamination within said slots, and said upper lamination is attachable to said imaging head for imaging said skin tissue through said viewing window and through said opening of said lower lamination to stabilize said skin tissue in said opening to said imaging head.

20 25. An apparatus for stabilizing the tissue of a patient to an imaging head comprising:

an attachment having a central circular window plate, a deformable diaphragm and a semi-rigid ring, wherein said diaphragm radially extends outward from said window plate to said semi-rigid ring;

25 said diaphragm having an annular protruding section which defines inner and outer cavities when said attachment is adjacent to the surface of said tissue; and

means for selectively creating suction in said inner and outer cavities when said attachment is adjacent to said the surface of said tissue to pull said tissue into said cavities, thereby stabilizing said tissue adjacent to said window plate for imaging by said imaging head.

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26. A system for examining the tissue of a patient comprising:
means for maintaining an area of the tissue under stress by application of force
at the edges of said area; and
an imaging head coupled to said means for imaging said stressed tissue to
provide therewith an integrated assembly.

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